



30 JUN 2005

(43) International Publication Date
15 July 2004 (15.07.2004)

PCT

(10) International Publication Number
WO 2004/059499 A3

(51) International Patent Classification⁷: **G06F 13/16**

Jan [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

(21) International Application Number:
PCT/IB2003/005709

(74) Agent: **DE JONG, Durk, J.**; Philips Intellectual Property & Standards, Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

(22) International Filing Date:
26 November 2003 (26.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
02080598.2 30 December 2002 (30.12.2002) EP

(71) Applicant (for all designated States except US): **KONINKLIJKE PHILIPS ELECTRONICS N.V.** [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

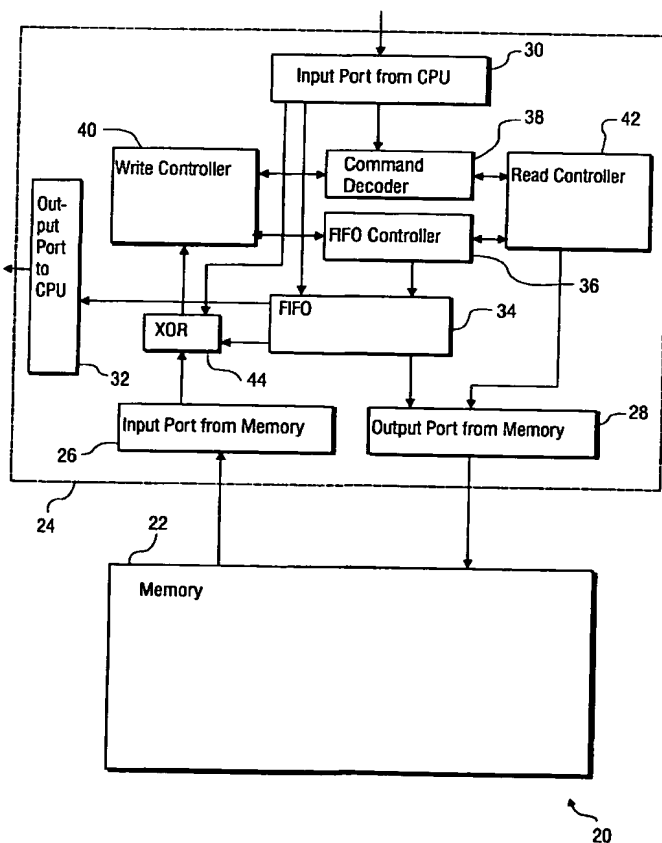
(84) Designated States (*regional*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE,

(72) Inventor; and

(75) Inventor/Applicant (for US only): **HOOGERBRUGGE,**

[Continued on next page]

(54) Title: MEMORY CONTROLLER AND METHOD FOR WRITING TO A MEMORY



(57) Abstract: The invention provides a controller for a memory having at least one memory cell, that involves a higher cost for writing than for reading. The memory cell is allocated to a first address information and adapted to store memory data. The memory controller of the invention comprises a register. A write controller connected with said register and said memory is adapted to receive a write request comprising said first address information and first write data allocated thereto, ascertain whether said first address information is stored in said register. If yes, the write controller compares said first write data with second write data of an earlier write request in said register allocated to said first address information. If no, it compares said first write data with said memory data allocated to the first address information. The write controller further forwards said first address information and said first write data to said register, respectively, and initiates a write operation of said first or second write data, respectively, from said register to said memory, if the first or second write data, respectively, is different from said memory data. With the memory controller of the invention write power can be saved while providing continuous access to the memory.

WO 2004/059499 A3



SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

Declaration under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK,*

Published:

- *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:

2 September 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 03/05709

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G06F13/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 982 675 A (FUJIMOTO) 9 November 1999 (1999-11-09) column 3, line 20 - column 5, line 27 column 9, line 44 - column 10, line 16 figures 4,5	1-3, 9-11, 14-19, 24,26
Y	US 6 151 658 A (MAGRO) 21 November 2000 (2000-11-21) column 2, line 20 - column 3, line 2 column 4, line 3 - column 5, line 44; figures 1,2 ----- -/-	1-3, 9-11, 14-19, 24,26

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

24 June 2004

Date of mailing of the international search report

30/06/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5618 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

McDonagh, F

INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 03/05709

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 16, 8 May 2001 (2001-05-08) & JP 2001 014219 A (NEC CORP), 19 January 2001 (2001-01-19) abstract	1,15-17, 26
A	PATENT ABSTRACTS OF JAPAN vol. 0123, no. 09 (P-748), 23 August 1988 (1988-08-23) & JP 63 079292 A (NEC CORP), 9 April 1988 (1988-04-09) abstract	1,15-17, 26

INTERNATIONAL SEARCH REPORT

national Application No

PCT/IB 03/05709

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 5982675	A	09-11-1999	JP	10154394 A	09-06-1998
US 6151658	A	21-11-2000	WO	9936849 A1	22-07-1999
JP 2001014219	A	19-01-2001	NONE		
JP 63079292	A	09-04-1988	NONE		